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# Introduction

The Software Design Document is a document that provides documentation which will aid in the development of the system by providing details of how the software should be built. Within the software design document are narrative and graphical documentation of the software design for the project including flow diagrams, use case models and other supporting requirement information.

# 1.1 Purpose

The purpose of this design document is to present a comprehensive architectural overview or technical details of the IOS mobile app analysis system components and more specifically:

* The definition of system architecture, components, classes, their attributes and methods that will implement the requested functionality.

It presents a number of different architectural views to depict different aspects of the system. It is intended to capture the significant architectural decisions which have been made on the system.

The primary intended audience of this document are system designers and system builders. The document intents to provide the team members of this project a unified view of the technical details of the system design to be followed during the development of the respective software. The document may need to be updated later to incorporate possible changes during development.

# 1.2 Scope

The IOS mobile app analysis system studies the relationship between app details and user ratings in order to help Apple developers study the features of the most downloaded apps on the Apple app store, to help them incorporate those features in their apps so as to increase the user ratings for their apps.

The IOS mobile app analysis system is unified for the use of all IOS mobile app users and developers all over the world. It’s based in RStudio, a free and open source integrated development environment for R programming language installed on a computer with the Shiny packages and other relevant packages.

The goal of the system is to provide a visual and statistical representation of the comparisons of the app features and app details which will assist programmers to design relevant apps and get higher user rating.

The objectives of the system are:

* To increase the user ratings for applications on the Apple IOS app store.
* To study how app features (details) affect user ratings for different apps.
* To compare app statistics for different groups.

# 1.3 Abbreviations and Acronyms

|  |  |
| --- | --- |
| **Term/ Acronym** | **Description/ Meaning** |
| app | Application |
| IOS | I phone Operating System |
| IEEE | Institution of Electrical and Electronics Engineers |
| REQ | Requirements |
| DESC | Description |

# 1.4 References

* SDD Template for IDA project

# 1.5 Overview

* Section 1 is the introduction and includes a description of the project, applicable and reference documents. It gives the reader an understanding of the system goals.
* Section 2 provides a system overview. This describes the system characteristics, system architecture, and infrastructure services.
* Section 3 contains the system context. This defines the external interfaces of the system.
* Section 4 describes the system design methods, standards and conventions.
* Section 5 contains the component descriptions. It describes how the different components of the system interact to satisfy the user needs.
* Section 6 includes the Requirements Traceability Matrix which shows the system components that satisfy each of the functional requirements from the SRS document.

# System overview

With the overwhelming number of alternative new apps coming up on the apple store, it is almost impossible to get more people to download your app. The system has been developed with an aim of analysing and visualizing app statistics on the app store using the various statistical tools of analysis and visualization to assist in increasing user ratings and to remain relevant to the market.

# 2.1 System characteristics

The systems user interface will be integrated with a web browser. The client side gathers information from users, investigates some actions of the users, and provides the connection with the server.

The server side system will hold the entire data in a graph database and must include all functionality to perform operations on this database, receives requests from the clients, evaluate, create and give the user a response to their action.

# 2.2 System Architecture

The system is a simple client-server system in which web technologies are used to provide forms from the server.

**CONCEPTUAL DIAGRAM**



figure 1: conceptual diagram 1

# 2.3 Infrastructure Services

The system will have the following added functionalities for its effective use:

* The response time is expected to be fast to increase efficiency, with a maximum waiting time of thirty seconds. This prevents the user from assuming that the system is down.
* The system will allow very many users at a time.
* The system should have a very low consumption of power.
* The system should be able to perfume failure handling that is the system components may fail independently of others so system components must be built so they can handle the failure of other components they depend on.
* The system will be integrated with Data Integrity Gateway tools to perform data cleaning to detect, eliminate and correct all errors and inconsistencies.
* The system should work reliably, with automatic backup and recovery features. In case of unexpected termination of a session, the unsaved data should be recovered without loss and displayed to the respective users.
* The system will be well documented to enable proper maintenance and in cases of further development and change of team members, they can still follow up.
* The entire system should be available round the year, except for a periodic maintenance. The maintenance period should be pre scheduled and short. The users should be reminded of the unavailability period, well in advance.

# System context

The user will access the home page that has all the functionalities of the system, after entering the system’s URL address in the URL bar.

The system requires http to communicate with the server. The system can be configured to be accessed via any available port.

The web based UI is the only means of communication between the user and the system. The system is accessible through all popular well browsers that interact with JSP and HTML pages.

The functionalities of the system are defined more in the context diagram below;

**THE CONTEXT DIAGRAM OF THE MOBILE APP ANALYSIS SYSTEM**



figure 2: context diagram

LEVEL ZERO DIAGRAM



figure 3: level zero diagram 1

# System Design

Our team used Agile methods as our design approach to designing and development of the system. We chose this approach because the aspects of the project were not well understood at the beginning. Completing the project in iterations helped us to break the problem of the system development into manageable mini-projects.

# 4.1 Design methods and standards

In reference to the conceptual diagram in figure 1, the system is web based. The client side is designed using R shiny dashboard with a number of inbuilt packages like G plot among others. It is designed to gather information from users, investigates some actions of the users, and provides the connection with the server. The server side system will hold the entire data in a graph and must perform all functionalities of the system ie; receives requests from the clients, evaluates, creates and sends the graphs.

# 4.2 Naming conventions

This document follows the IEEE format; bold faced font has been used for emphasis, headings and sub headings. Highlighted words are used in the glossary and italicized text is used in the diagram labelling.

# 4.3 Software development tools

These are some of the tools used in the design and development of the system.

|  |  |
| --- | --- |
| **Tool** | **Role played** |
| Microsoft Visio | Drawing the diagrams in the document |
| Microsoft office word | Text documentation |
| R shiny | Package for creating R applications |
| R shiny dashboard | Designing the system interface |
| GG plot | Package for plotting the graphs |

# 4.4 Outstanding issues

There aren’t many outstanding issues to talk about but as earlier stated, we are using the agile development technology so as more aspects arise, they shall be included in the design of the system.

# 4.5 Decomposition description

The system functionality has been broken down and is represented as a functional decomposition diagram and data flow diagrams.

**FUNCTIONAL DECOMPOSITION DIAGRAM**



figure 4: functional Decomposition diagram

# Component description

**Module 1: Data Analysis**

This module is the core part of the system and will be called frequently and its results will depend on the user commands. The user will choose which parameters to be analysed and how they should be analysed using the graphical interface.

Module inputs:

* User selections/choices

Module outputs:

* Analysis results
* Textual reports

**Module 2: Graphical Representation of results**

The analytical results from module 4 will be presented in a graphical view based on the user selections. A number of graphical features including but not limited to line graphs, bar graphs, pie charts, box plots will be used by this module to display data to the user. The user will select the tool they wish to use to view the results.

Module inputs

* User selections/choices
* Analysis results

Module outputs

* Graphs: Histogram, bar graph, scatter plot.

# Requirements Traceability Matrix

|  |  |  |
| --- | --- | --- |
| **System requirement No** | **Functional requirement** | **Description** |
| **REQ 1** | Display apps and app details | This feature allows the user to view all the apps on the system with all their app details in a table form. The system also has a search button that enables the user to quickly find any particular app they want without scrolling through the whole page. |
| **REQ 2** | Comparing user ratings and app details. | The system compares user ratings and app details. |
| **REQ 3** | Comparing app statistics for different app groups | The system compares app statistics for different app groups |
| **REQ 4** | Comparing different apps in the same group | The system compares different apps in the same group |
| **REQ 5** | Analysing app descriptions | The system analyses the descriptions for the different apps and determines whether they are positive or negative comments. |

# Glossary

|  |  |
| --- | --- |
| **Term/ Acronym** | **Description/ Meaning** |
| app | Application |
| IOS | I phone Operating System |
| IEEE | Institution of Electrical and Electronics Engineers |
| REQ | Requirements |
| DESC | Description |